

University of Wollongong

Research Online

Faculty of Health and Behavioural Sciences -
Papers (Archive)

Faculty of Science, Medicine and Health

1-1-2009

Is the consideration of better and worse alternatives to reality advantageous to mood after a positive outcome?

Rebecca Zuchetti

University of Wollongong, rz05@uow.edu.au

Amy Y.C. Chan

University of Wollongong, amychan@uow.edu.au

Follow this and additional works at: <https://ro.uow.edu.au/hbspapers>



Part of the [Arts and Humanities Commons](#), [Life Sciences Commons](#), [Medicine and Health Sciences Commons](#), and the [Social and Behavioral Sciences Commons](#)

Recommended Citation

Zuchetti, Rebecca and Chan, Amy Y.C.: Is the consideration of better and worse alternatives to reality advantageous to mood after a positive outcome? 2009, 196-201.
<https://ro.uow.edu.au/hbspapers/298>

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library: research-pubs@uow.edu.au

Is the consideration of better and worse alternatives to reality advantageous to mood after a positive outcome?

Abstract

Counterfactual thinking involves reflecting on how a given outcome may have been different. Such thoughts are centred on how the outcome could have been better (upward counterfactuals) or worse (downward counterfactuals), with most previous research focusing on a specified direction of these thoughts in response to a negative outcome. The current research explored how considering either one or both directions of counterfactuals after a positive outcome in an anagram task may be related to changes in affect and subsequent task performance. Undergraduate psychology students (N = 86) either imagined only better or worse counterfactual alternatives in response to their anagram task performance, or considered both better and worse alternatives. Mood ratings before and after counterfactual generation were assessed, with self-efficacy, preparedness, and task performance also examined. Mood ratings significantly declined in the upward only and downward followed by upward conditions, with no change occurring in the downward only or downward last conditions. Upward counterfactuals also resulted in a significant increase in the proportion of time for anagram task completion. The findings demonstrate that the expected preparedness effects of counterfactual generation did not prevail after a positive outcome, and that a recency effect on mood occurs for the last counterfactual generated.

Keywords

after, positive, advantageous, reality, alternatives, consideration, worse, mood, better, outcome

Disciplines

Arts and Humanities | Life Sciences | Medicine and Health Sciences | Social and Behavioral Sciences

Publication Details

Zuchetti, R. & Chan, A. Y. C. (2009). Is the consideration of better and worse alternatives to reality advantageous to mood after a positive outcome?. In N. Voudouris & V. Mrowinski (Eds.), *Proceedings of the 44th Annual APS Conference* (pp. 196-201). Melbourne, VIC: Australian Psychological Society Ltd.

Is the Consideration of Better and Worse Alternatives to Reality Advantageous to Mood after a Positive Outcome?

Rebecca Zuchetti (rz05@uow.edu.au)

School of Psychology

University of Wollongong, Wollongong NSW 2522 Australia

Amy Y.C. Chan (amychan@uow.edu.au)

School of Psychology

University of Wollongong, Wollongong NSW 2522 Australia

Abstract

Counterfactual thinking involves reflecting on how a given outcome may have been different. Such thoughts are centred on how the outcome could have been better (upward counterfactuals) or worse (downward counterfactuals), with most previous research focusing on a specified direction of these thoughts in response to a negative outcome. The current research explored how considering either one or both directions of counterfactuals after a positive outcome in an anagram task may be related to changes in affect and subsequent task performance. Undergraduate psychology students ($N = 86$) either imagined only better or worse counterfactual alternatives in response to their anagram task performance, or considered both better and worse alternatives. Mood ratings before and after counterfactual generation were assessed, with self-efficacy, preparedness, and task performance also examined. Mood ratings significantly declined in the upward only and downward followed by upward conditions, with no change occurring in the downward only or downward last conditions. Upward counterfactuals also resulted in a significant increase in the proportion of time for anagram task completion. The findings demonstrate that the expected preparedness effects of counterfactual generation did not prevail after a positive outcome, and that a recency effect on mood occurs for the last counterfactual generated.

After experiencing a somewhat positive outcome, have you ever thought about how this outcome could have been even better or how it could have been worse, had some factor been different? This type of thinking is referred to as counterfactual thinking, and is a common mental phenomenon occurring in everyday life. It is a process of inner reflection as to how any given outcome may have turned out differently if some alternative event had occurred (Bryne, 2002; Roese, 1994; Roese & Olson, 1995). Counterfactual thinking thus requires the attribution of causality to a real or hypothetical antecedent in order to bring about the imagined change in the consequent (e.g. Roese, 1994; Roese & Olson, 1995). Such thinking enables people to evaluate the

outcomes of their experiences by comparing possible alternatives to reality (Boninger, Gleicher, & Strathman, 1994). For example, 'If I had not missed the lectures on reasoning, I could have got an A in the final exam instead of a B'. As this thought focuses on how the outcome could have been better, it is referred to as an upward counterfactual. Research has shown that such thoughts tend to result in a decline in affect and a greater sense of preparedness for a similar future event (Markman, Gavanski, Sherman, & McMullen, 1993; Roese, 1994; Sanna, Meier & Wegner, 2001).

On the other hand, reflective thoughts pertaining to how a given outcome may have been worse are known as downward counterfactuals. For example, 'If I had missed even more lectures, I could have got a C or a D in the exam'. These types of thoughts have a tendency to improve one's mood at the expense of no greater sense of preparedness for a similar future occurrence (Boninger et al., 1994; Roese, 1997).

Although the literature clearly demonstrates the effect of upward counterfactuals on affect and preparedness, mixed results have been observed for downward counterfactuals. The majority of research has found that mood significantly improves after downward counterfactual generation, generally in response to a negative outcome (c.f. Roese, 1994; Sanna, 1996). However, several studies documented in the literature have not found evidence for mood improvement after the generation of downward counterfactuals (e.g. Mandel, 2003).

Previous research examining the effect of counterfactual thinking on mood has required participants to either a) explicitly generate a particular direction of counterfactual (i.e. upward or downward) (e.g. Mandel, 2003) or b) to generate counterfactuals spontaneously (e.g. Roese & Hur, 1997). However, no published research to date has examined how the consideration of both upward and downward counterfactuals (dual counterfactual generation) as compared to the consideration of a single direction of counterfactual, affects mood and preparedness. Zuchetti

and Chan (2009) conducted an exploratory study to assess how single versus dual counterfactual generation affected mood. Participants were required to a) read a hypothetical scenario and b) generate a scenario pertaining to their past experience. In the pre-determined scenario task (outcome perceived as neutral), the expected effects on mood were found: mood declined after upward counterfactuals, improved after downward counterfactuals, and remained relatively neutral after considering both directions of counterfactuals. In the self-generated scenario task however (outcome perceived as positive), there was no significant change in mood after the generation of downward counterfactuals and in the dual counterfactual conditions, a recency effect was apparent for the last counterfactual generated.

The Present Experiment

The current experiment was an extension and adaptation of the anagram task conducted by Roese (1994, Exp. 3). As the majority of empirical research in this field has focused on negative outcomes (e.g. Boninger et al., 1994; Mandel, 2003; Roese, 1994) our first aim was to examine how the application of counterfactual thinking after a positive outcome affects mood and preparedness. A positive outcome in the current anagram task was achieved through manipulating participants' perception of how they performed in an anagram task compared to the other participants who had supposedly already completed the task. Employing a positive outcome enabled the exploration of any parallels between counterfactual thinking in response to positive and negative outcomes.

A second aim was to provide a comparison of the effect of single and dual counterfactual generation on affect and preparedness. This was accomplished through utilising two single counterfactual conditions: upward (how the outcome could have been better) and downward (how the outcome could have been worse), and two dual counterfactual conditions of upward followed by downward counterfactuals and downward followed by upward counterfactuals. The two dual conditions allowed for the assessment of a recency effect for the last counterfactual generated. Further, it was aimed to generalise the findings of Zuchetti and Chan (2009) in a laboratory task directly pertaining to participants' immediate experience. This was to provide the same experience for all participants from which they could generate counterfactuals, and thus ensure task consistency.

In line with the literature, it was hypothesised that upward counterfactuals would result in a decline in mood and increased preparedness, and downward counterfactuals will lead to an improvement in mood but reduced preparedness to complete an unexpected

second anagram task. On the basis of the findings of Zuchetti and Chan (2009), it was predicted that the consideration of both upward and downward counterfactuals would result in a recency effect, in that the direction of the last counterfactual generated would reflect the change in mood occurring in its single direction counterpart.

Method

Participants

Eighty-six first year Psychology students from the University of Wollongong voluntarily participated in the experiment for partial subject credit. Sixteen participants were excluded from data analysis for solving less than seven anagrams correctly and subsequently did not perceive the outcome as being positive; three were excluded for not generating any counterfactuals; and one was excluded for failing to respond to the mood adjective ratings. Thus the final sample consisted of 66 participants with a mean age of 21.67 years ($SD = 7.06$), ranging from 18 to 49 years. All participants were recruited and tested in accordance with research protocol approved by the University of Wollongong Human Research Ethics Committee.

Design

A 2 (last counterfactual: upward vs. downward) \times 2 (number of counterfactual opportunities: single vs. dual) \times 2 (mood assessment) mixed design was employed, producing the four counterfactual conditions to which participants were randomly assigned. Each of the conditions consisted of approximately 17 participants (range = 15-18).

The main dependent measures included a) a general mood assessment conducted after completion of Task 1, and again after generating counterfactuals; b) emotion adjective ratings before and after counterfactual generation; c) a self-efficacy measure, rated prior to Task 1 performance, after Task 1 completion, and again after counterfactual generation; and d) a preparedness measure before completing Task 2 of which participants were initially unaware of having to complete.

Materials

A program was designed for the presentation of the anagram task and the rating scales on a PC. The program recorded all the relevant data for each participant using an anonymous participant code. The words used for the anagram task were taken from the MRC Database and formed two blended categories, i) animals and nature, and ii) food and body parts, with each category consisting of ten anagrams. Word categories were blended as pilot testing revealed a category priming effect. Each word consisted of five

letters and was randomly scrambled by the researcher (e.g. storm – tmsro, and chest – hsetc).

The mood assessment measures used in this experiment included a general mood rating scale with a happy and sad face as polar opposites, and four 9-point rating scales utilising the emotion adjectives of *glad*, *frustrated*, *satisfied*, and *disappointed* (taken from Sanna, 1996), ranging from 1 = ‘Not at all’ to 9 = ‘Very’. The self-efficacy measure adapted from Tal-or, Boninger, and Gleicher (2004), consisted of participants rating on a 9-point scale how good they thought they would be (were) at the task. Participants’ preparedness to complete the anagram task a second time was assessed on two 9-point scales by asking ‘After thinking about how the outcome could have been different, how confident would you feel in doing the task a second time?’ and ‘If you had to do the task a second time, how ready would you feel?’

Procedure

Each participant took part in an individual session with the experimenter present, lasting for approximately 20 minutes. After being briefed about the nature of the task and given two practice anagrams from an unrelated category (colour: “cbakl” and “tihwe”), instructions for completion of the task were verbally given. Participants had two minutes to solve each anagram, after which the next anagram was presented. A timer was visible to participants on the bottom of the screen for each anagram. Based on the procedure used by Roese (1994, Exp. 3), participants were awarded one point for each second remaining of the two minutes for each anagram solved correctly.

Following Roese (1994, Exp. 3) there were two options available to help participants solve the anagrams, each with a cost to their final score. The first option was that participants could choose to buy one clue for each word by pressing <C> on the keyboard. This would provide the first letter of the solution. Participants were told that each clue would cost them 30 points of their final score.

The second option was that participants could skip an anagram if they found it too difficult by pressing <S> on the keyboard. They could not go back to the anagrams they had skipped and points were deducted from their score based on the time spent trying to solve the anagram. Participants were told that at the completion of the task, they would learn how their performance was compared to other people who had previously completed the task. Participants could then choose one of the two categories of words. Before commencing the task, participants were asked to rate their self-efficacy (Time 1).

Participants verbally stated the solution to each anagram to which the experimenter answered ‘yes’ or

‘no’. After stating the correct solution, or after the time had elapsed, the next anagram was displayed. After the last anagram was solved, the participants’ final score was displayed, along with the number of clues bought and the number of anagrams skipped. A line graph illustrating that the participants’ score was above average (approximately in the 75th percentile) in a normal distribution, compared to the other participants who had already supposedly completed the task was displayed. Participants were then asked to rate how they felt about their performance in the task on five rating scales, followed by the second self-efficacy scale.

Participants were then asked to generate counterfactuals depending upon their condition. For example, participants in the upward followed by downward condition were asked, ‘Can you think of as many ways as you can as to how your performance in the task could have been better?’ The experimenter wrote down the participants’ responses, and then asked ‘Now can you think of as many ways as you can as to how your performance in the task could have been worse?’ After generating counterfactuals, participants were asked to rate the same mood adjectives again, followed by the self-efficacy scale, and the two preparedness questions.

Afterwards, participants were asked to complete an unexpected second anagram task, using the other category of words not chosen for Task 1. After completing Task 2, participants were shown their performance data, and were then verbally debriefed.

Results

Composite Mood

After coding the counterfactuals as upward or downward and relevant to the task, Pearson correlations were conducted on the four mood adjectives whereby it was found that all variables were significantly correlated in the anticipated direction at the .01 level (levels of association ranged from .40 to .78). A composite mood variable was thus formed by averaging frustrated and disappointed (both reverse scored) with glad and satisfied. To determine the change in mood after counterfactual generation, a last counterfactual by number of counterfactual opportunities mixed design ANOVA was conducted on the composite mood ratings obtained before and after counterfactual generation with the second general mood ratings used as a covariate¹.

Significant two-way interaction was apparent between last counterfactual and mood assessment ($F(1,61) = 14.00, p = .00$), with mood significantly

¹ Due to the presence of a marginally significant difference between conditions for general mood ratings at Time 2 ($F(3,62) = 2.49, p = .07$), this variable was used as a covariate in all subsequent data analyses.

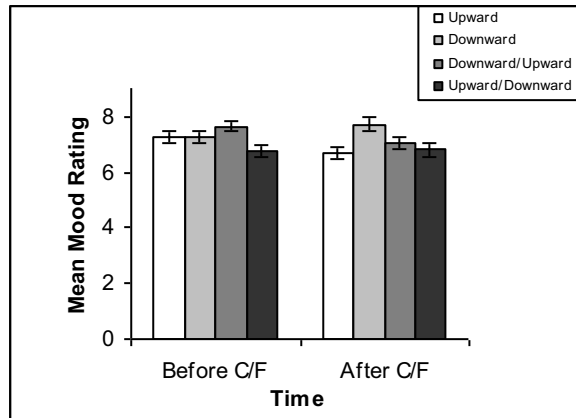


Figure 1: Changes in mean composite mood ratings. Error bars indicate one standard error of the mean.

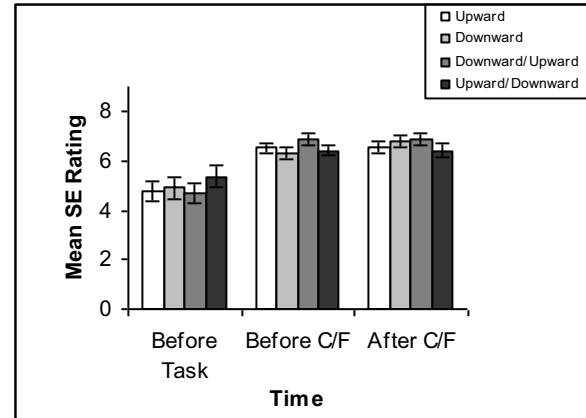


Figure 2: Changes in mean Self-Efficacy (SE) ratings. Error bars indicate one standard error of the mean.

declining in the upward only and upward last conditions. The mean difference of the first and second mood ratings was .57 ($p = .00$), compared to $-.23$ ($p = .14$) for the downward only and downward last condition (see Figure 1). This finding suggests that a recency effect is present for the last counterfactual generated, with significant change in mood occurring after upward generation.

Self-Efficacy and Preparedness

A last counterfactual by number of counterfactual opportunities mixed design ANOVA was conducted on the self-efficacy ratings at Time 1 (prior to task completion) and Time 2 (after task completion), and as expected, self-efficacy ratings did not vary significantly between conditions ($F(1,61) = 3.16$, $p = .08$)², with the means indicating that self-efficacy increased after task completion in all conditions (see Figure 2). To determine if self-efficacy ratings changed after counterfactual generation across conditions, a second mixed design ANOVA was conducted on self-efficacy ratings at Time 2 (after task completion) and Time 3 (after counterfactual generation). Contrary to expectations, self-efficacy ratings did not vary across conditions after counterfactual generation ($F(1,61) = 0.78$, $p = .38$).

A last counterfactual by number of counterfactual opportunities factorial ANOVA was conducted on each of the preparedness ratings, namely confidence and readiness to complete the task a second time. No significant interaction between conditions was found

for confidence ($F(1,61) = 2.76$, $p = .10$), or readiness ($F(1,61) = 0.75$, $p = .39$) (see Table 1). Contrary to our hypothesis and established findings, counterfactual generation did not result in a greater sense of preparedness for any of the counterfactual conditions.

Table 1: Mean Preparedness Ratings (with Standard Deviations in Parentheses)

Condition	Confidence	Readiness
Upward	6.35 (1.19)	6.94 (1.39)
Downward	7.20 (0.68)	7.87 (0.74)
Upward/Downward	6.50 (1.46)	7.25 (1.44)
Downward/Upward	7.11 (1.32)	7.61 (1.33)

Performance Measures

Last counterfactual by number of counterfactual opportunities factorial ANOVAs were conducted on each of the performance measures. A 2-way interaction between the number of counterfactual opportunities and last counterfactual generated for the proportional change in average trial time variable was found ($F(1,61) = 4.16$, $p = .05$). Means indicate that upward only and upward followed by downward counterfactuals resulted in the greatest change in the proportion of time taken to complete Task 2 in relation to Task 1. Therefore, participants who considered only upward counterfactuals or upward followed by downward counterfactuals took a greater amount of time to complete the second anagram task. In comparison, participants generating downward only or downward followed by upward counterfactuals spent less time completing Task 2, however the difference was minimal (see Figure 3). No other analyses on the performance measures of number of skips made,

² Three-way interaction between last counterfactual, number of counterfactual opportunities and the respective dependent variable is reported for all non-significant results unless otherwise stated.

number of clues bought, total number of anagrams solved correctly, and final score reached significance.

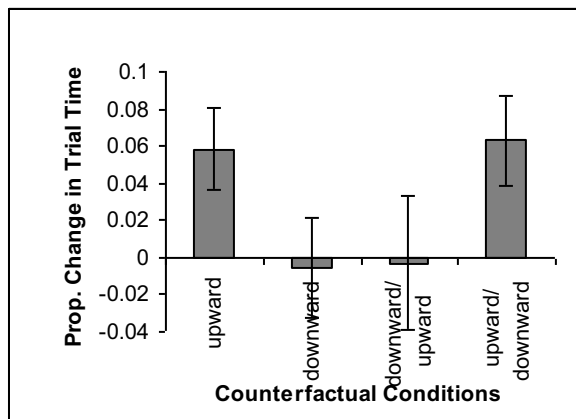


Figure 3: Proportional change in average trial time. Error bars indicate one standard error of the mean.

Discussion

The primary aim of the current experiment was to provide a comparison of the effect of single and dual counterfactual generation on mood and preparedness. This was achieved through expanding and adapting the design of Roese (1994, Exp. 3) to examine how the application of counterfactual thinking applies after a positive outcome directly pertaining to participants' immediate experience. As hypothesised and consistent with the findings of the positive outcome scenario task conducted by Zuchetti and Chan (2009), the generation of upward counterfactuals evidenced the most significant alteration in affect. In line with the literature (e.g. Boninger *et al.*, 1994; Markman *et al.*, 1993; Roese, 1997; Sanna, 1996) composite mood analyses revealed a significant decline in affect after upward only and upward last counterfactual generation, suggesting that upward counterfactuals when considered solely or last, have the most significant effect on mood after a positive outcome.

In contrast, downward counterfactuals when considered solely or after upward counterfactuals had no significant effect on participants' composite mood ratings. Although not consistent with our initial hypotheses or those documented in the literature that typically involve negative outcomes (e.g., Roese, 1994; Sanna, 1996), the findings are consistent with Mandel (2003) in which mood improvement was not apparent for any of the emotions examined. It thus appears that there may be little benefit in considering and reflecting upon the ways in which a somewhat positive outcome may have been worse.

Consistent with our initial predictions, the change in mood after dual counterfactual generation reflected the

mood change occurring in the single condition of the last counterfactual generated. Thus the downward followed by upward counterfactual condition echoed the decline in the composite mood ratings of the upward only condition. Similarly, the upward followed by downward condition evidenced the lack of change occurring in composite mood ratings in the downward only condition. Thus a recency effect of the last counterfactual generated is clearly demonstrated. This finding is consistent with the results the positive outcome scenario task in Zuchetti and Chan (2009).

No significant difference in self-rated feelings of preparedness to complete the task a second time was evident. This is contrary to expectation whereby it was anticipated that the anagram task would foster a greater sense of preparedness than a hypothetical or self-described scenario task. Similarly, there was no significant difference between conditions in participants' self-rated feelings of self-efficacy post counterfactual generation. This lack of difference between conditions in preparedness and self-efficacy ratings may be attributable to the positive outcome of the anagram task or the experimental nature of the research.

The performance measures also did not yield any significant difference between conditions. The current experiment therefore demonstrates that after a positive outcome in a performance-oriented task, counterfactual generation has no significant effect on quantifiable performance measures, such as those employed in the current research. A significant difference however, was apparent in the amount of time taken to complete Task 2 in relation to Task 1, with upward only and upward followed by downward counterfactuals having the greatest increase. Hence it appears that participants' initial reflections as to how their performance could have been better may have had a slight impact on their performance in the second anagram task. This impact however, did not extend the effect to a conscious level of participants' performance.

Several limitations of the current research can be identified. First, the laboratory nature of the anagram task may not wholly equate to participants' performance and subsequent reflections on a real life event. This may account for the lack of a significant difference between conditions in self-reported ratings of preparedness and self-efficacy. Secondly, participants' actual sense of preparedness to complete the anagram task a second time may not have been accurately represented in the rating scales. A final consideration regards the uncontrollable factor of participants' non-verbalised reflections. Although participants were explicitly asked to generate counterfactuals in a particular direction, they may have also considered the other direction of counterfactual automatically, as is likely to occur in everyday life.

Overall, the results of the current experiment reflect those of the positive outcome scenario task conducted by Zuchetti and Chan (2009). Upward counterfactuals resulted in a decline in affect and downward counterfactuals evidenced no significant change in affect. As for the dual counterfactual conditions, a recency effect on mood for the last counterfactual generated was evident. The lack of mood improvement occurring after downward generation and the deficiency of preparedness and self-efficacy effects may be attributable to the positive outcome of the anagram task. The current research has therefore demonstrated that thinking counterfactually after a positive outcome does not result in the same preparedness effects as after a negative outcome (c.f. Roese, 1994).

The current research replicated the general findings of the positive outcome scenario task of Zuchetti and Chan (2009) utilising an adaptation of Roese's (1994, Exp. 3) anagram task with a positive outcome. This has assisted in clarifying the recency effect for the last counterfactual generated. However, future research would further elucidate the effect of dual counterfactual generation on mood and preparedness by replicating the design of the current experiment and employ a negative outcome.

References

- Boninger, D.S., Gleicher, F., & Strathman, A. (1994). Counterfactual thinking: From what might have been to what may be. *Journal of Personality and Social Psychology*, 67, 297-307.
- Byrne, R.M. (2002). Mental models and counterfactual thoughts about what might have been. *Trends in Cognitive Sciences*, 6, 426-431.
- Mandel, D.R. (2003). Counterfactuals, emotions, and context. *Cognition and Emotion*, 17, 139-159.
- Markman, K.D., Gavanski, I., Sherman, S.J., & McMullen, M.N. (1993). The mental simulation of better and worse possible worlds. *Journal of Experimental Social Psychology*, 29, 87-109.
- Roese, N.J. (1994). The functional basis of counterfactual thinking. *Journal of Personality and Social Psychology*, 66, 805-818.
- Roese, N.J. (1997). Counterfactual thinking. *Psychological Bulletin*, 121, 133-148.
- Roese, N.J. & Hur, T. (1997). Affective determinants of counterfactual thinking. *Social Cognition*, 15, 274-290.
- Roese, N.J. & Olson, J. M. (1995). 'Counterfactual thinking: A critical overview' in N. J. Roese & J. M. Olson (Eds.), *What might have been: The social psychology of counterfactual thinking* (pp. 1-55). Mahwah, NJ: Erlbaum.
- Sanna, L.J. (1996). Defensive pessimism, optimism, and simulating alternatives: Some ups and downs of prefactual and counterfactual thinking. *Journal of Personality and Social Psychology*, 71, 1020-1036.
- Sanna, L.J., Meier, S., & Wegner, E.A. (2001). Counterfactuals and motivation: Mood as input to affective enjoyment and preparation. *British Journal of Social Psychology*, 40, 235-256.
- Tal-or, N., Boninger, D.S., & Gleicher, F. (2004). On becoming what might have been: Counterfactual thinking and self-efficacy. *Self and Identity*, 3, 5-26.
- Zuchetti, R. & Chan, A.Y.C. (2009). *The effect of simultaneous counterfactual generation on mood*. Manuscript in preparation.